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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/071,869	02/08/2002	Yixing Lin	006846 USA/CPS/IBSS	8725

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APPLIED MATERIALS, INC.
2881 SCOTT BLVD. M/S 2061
SANTA CLARA, CA 95050

EXAMINER

MORILLO, JANELLE COMBS

ART UNIT	PAPER NUMBER
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1742

DATE MAILED: 10/06/2004

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

10/071,869

Applicant(s)

LIN ET AL.

Examiner

Janelle Combs-Morillo

Art Unit

1742

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 29 June 2004.
- 2a) ☒ This action is **FINAL**. 2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 8-20, 24, 25 and 28-34 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 8-20, 24, 25 and 28-34 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. _____.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- * See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- 1) ☐ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☐ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)
Paper No(s)/Mail Date _____.
- 4) ☐ Interview Summary (PTO-413)
Paper No(s)/Mail Date. _____.
- 5) ☐ Notice of Informal Patent Application (PTO-152)
- 6) ☐ Other: _____.

DETAILED ACTION

Claim Objections

1. Claim 13 is objected to because of the following informalities: claim 13 does not further limit independent claim 8. Appropriate correction is required.

Claim Rejections - 35 USC § 103

2. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

3. Claims 8-16 are rejected under 35 U.S.C. 102(b) as being anticipated by Miyashita (5,039,388).

Miyashita teaches a high purity (column 3 lines 35-40) aluminum alloy with controlled particulate size of $\leq 2 \mu\text{m}$ (column 3 lines 48-49) for use in semiconductor processing apparatus (column 1 lines 7-13). The maximum particle diameter of intermetallic compounds such as $\beta\text{-AlFeSi}$, TiAl_3 , or MnAl_6 do not exceed $1.5 \mu\text{m}$ (column 5 line 59), which meets the presently claimed microstructural limitations (all particles are less than $5 \mu\text{m}$, none are between $5\text{-}20 \mu\text{m}$, none are between $20\text{-}50 \mu\text{m}$). Miyashita teaches that an anodic oxidation layer is applied to said aluminum alloy in order to increase corrosion resistance (column 2 lines 43-44, 63-64, column 3 line 9). Miyashita does not specify that any other intermetallic phases are present for said high purity Al-Mg alloy (column 3 lines 40-43). Therefore, because Miyashita teaches an overlapping

Art Unit: 1742

method of producing a article, substantially as presently claimed, it is held that Miyashita has created a prima facie case of obviousness of the presently claimed invention.

Concerning claims 12-14, Miyashita teaches an aluminum alloy example with 99.997% purity, and further containing 4% Mg, 20 ppm (0.002%) of each Fe and Si. Miyashita does not mention the presence of Cu, Mn, Zn, Cr, or Ti, and therefore these elements are held to be substantially zero.

Concerning claims 15 and 16, because Miyashita teaches a substantially overlapping process, performed on a alloy that falls within the instant composition ranges and microstructural features, then the corrosion resistance with respect to active halogen species is expected to be present.

4. Claims 17, 20, 28, 31, and 32 are rejected under 35 U.S.C. 103(a) as being unpatentable over Hisamoto et al (US 6,066,392) and Miyashita (5,039,388).

Hisamoto teaches a process for providing an anodic oxidation film on an aluminum alloy that is excellent in gas and plasma corrosion resistance (abstract). Hisamoto teaches the electrolytic oxidation process involves anodizing in an aqueous solution of 10-20g/l oxalic acid and 100-200 g/l of sulfuric acid, which converts to 1-2% oxalic acid and 10-20% sulfuric acid (wherein 10g oxalic acid/ 1000g water=1%, 20g oxalic acid/ 1000g water= 2%, 1L=1000g of water). Hisamoto teaches that said electrolytic solution can be adjusted to control the incorporated amounts of C (oxalic acid) and S, C, and N (sulfuric acid) (column 10 lines 53-61). The electrolyte voltage in anodic oxidation is typically 5-200 V (column 9 line 14). Hisamoto does not disclose the temperature at which the anodizing treatment takes place, and therefore it is

Art Unit: 1742

held to take place at substantially room temperature (approx. 20°C). Hisamoto does not teach the use of a high purity alloy with the instant microstructural characteristics.

Miyashita, who is also drawn to forming anodized coatings on aluminum alloys, teaches a high purity (column 3 lines 35-40) aluminum alloy with controlled particulate size of $\leq 2 \mu\text{m}$ (column 3 lines 48-49) for use in semiconductor processing apparatus (column 1 lines 7-13). The maximum particle diameter does not exceed $1.5 \mu\text{m}$ (column 5 line 59), which meets the presently claimed microstructural limitations (all particles are less than $5 \mu\text{m}$, none are between $5\text{-}20 \mu\text{m}$, none are between $20\text{-}50 \mu\text{m}$). Miyashita teaches that an Al-Mg alloy composition of high purity is preferred because if particles $> 2 \mu\text{m}$ are present on the surface of the material, they form electrode regions resulting in an inconsistent surface (column 3 lines 49-53). It would have been obvious to one of ordinary skill in the art to use the Al-Mg alloy with small particles in the process taught by Hisamoto, because Miyashita teaches that a more uniform anodizing layer can be achieved on Al-Mg alloys with maximum particle diameter $< 1.5 \mu\text{m}$.

Concerning claims 20 and 31, Hisamoto teaches that the pore sizes range $5\text{-}150 \text{ nm}$, which falls within the instant range of $30\text{-}75 \text{ nm}$.

Concerning claim 28, Miyashita teaches an aluminum alloy example with 99.997% purity, and further containing 4% Mg, 20 ppm (0.002%) of each Fe and Si. Miyashita does not mention the presence of Cu, Mn, Zn, Cr, or Ti, and therefore these elements are held to be substantially zero.

5. Claims 18-20, and 29-32 are rejected under 35 U.S.C. 103(a) as being unpatentable over Hisamoto et al (US 6,066,392) and Miyashita (5,039,388), as applied to claims above, in view of "XP-002244144" hereinafter XP'144.

Concerning claims 18, 19, 29, and 30 neither Hisamoto nor Miyashita teach the surface cleaning with the phosphoric/nitric acid solution substantially as presently claimed (though Miyashita teaches a surface pretreatment followed by water washing is customary to prepare the surface, column 4 lines 13-16). However, it is known to prepare the surface of articles to be anodized by cleaning with acidic solutions prior to anodization (XP'144 at p. 586 column 2). XP'144 teaches "the cleaning method is selected on the basis of the type of soils or contamination that must be removed" (XP'144 at p. 586 column 2).

Changes in temperature, concentrations, or other process conditions of an old process does not impart patentability unless the recited ranges are critical, i.e. they produce a new and unexpected result. However, said parameter must first be recognized as a result-effective variable, i.e., a variable which achieves a recognized result, before the determination of the optimum or workable ranges of said variable might be characterized as routine experimentation. *In re Antonie*, 559 F.2d 618, 195 USPQ 6 (CCPA 1977), See also *In re Boesch*, 617 F.2d 272, 205 USPQ 215 (CCPA 1980). Because the composition of the cleaning solution is recognized as a result effective variable, it would have been obvious to one of ordinary skill in the art to determine an optimum or workable range of said variable.

6. Claims 24, 25, 33, and 34 are rejected under 35 U.S.C. 103(a) as being unpatentable over Hisamoto et al (US 6,066,392) and Miyashita (5,039,388) in view of JP 08-311594 (JP'594).

Concerning claims 24, 25, 33, and 34 neither Hisamoto nor Miyashita teach the instant annealing treatment. However, JP'594 teaches that an Al-Mg alloy that overlaps the composition taught by the combination of Hisamoto and Miyashita has excellent tensile strength when subjected to a process annealing of 200-260°C (see abstract, etc.). It would have been obvious to

one of ordinary skill in the art to anneal the alloy taught by the combination of Hisamoto and Miyashita at 200-260°C in order to obtain excellent tensile strength.

Response to Arguments/Amendment

7. In the response filed on June 29, 2004 applicant amended claims 8 and 17, and cancelled claims 1-7, 21-23, 26, and 27. The examiner agrees no new matter has been added.

Applicant's argument that the present invention is allowable over the prior art of record because Miyashita teaches concentrations of elements higher than those specified by applicant (arguments p 9, 12) has not been found persuasive. As stated in the rejection above, Miyashita teaches an aluminum alloy example with 99.997% purity, and further containing 4% Mg, 20 ppm (0.002%) of each Fe and Si, which falls within the presently claimed alloying ranges.

Applicant's argument that the present invention is allowable over the prior art of record because Miyashita teaches no particles having a diameter exceeding 2 μm , has not been found persuasive (arguments p 11). The instant claims do not require a minimum amount of particles to be $>2 \mu\text{m}$. Additionally, as stated above, Miyashita does not specify that any other intermetallic phases are present for said high purity Al-Mg alloy (column 3 lines 40-43).

Applicant's argument that the present invention is allowable over the prior art of record because Miyashita does not relate to the ability of an anodized layer to prevent attack of the aluminum alloy underlying the anodized layer (arguments p 13) has not been found persuasive. Miyashita teaches that an anodic oxidation layer is applied to said aluminum alloy in order to increase corrosion resistance (column 2 lines 43-44, 63-64, column 3 line 9), helping to prevent attack from active fluorine gas (column 3 lines 9-10).

Conclusion

8. **THIS ACTION IS MADE FINAL.** Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire **THREE MONTHS** from the mailing date of this action. In the event a first reply is filed within **TWO MONTHS** of the mailing date of this final action and the advisory action is not mailed until after the end of the **THREE-MONTH** shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than **SIX MONTHS** from the mailing date of this final action.

9. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Janelle Combs-Morillo whose telephone number is (571) 272-1240. The examiner can normally be reached on 8:30 am- 6:00 pm.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Roy King can be reached on (571) 272-1244. The fax phone number for the organization where this application or proceeding is assigned is (703) 872-9306.

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the receptionist whose telephone number is (703) 308-0661.

Jcm
October 4, 2004

ROY KING
SUPERVISORY PATENT EXAMINER
TECHNOLOGY CENTER 1700